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The Honorable Tom Coburn, M.D.
United States Senate
Chairman, Subcommittee on Federal Financial Management
Committee on Homeland Security and Governmental Affairs
439 Hart Senate Office Building
Washington, D.C. 20510

Dear Senator Coburn:

This is in response to your letter requesting information on research at the University of New Hampshire.

This University does request and obtain earmarks through our Congressional delegation. We do so for high priority projects and programs for which funding otherwise is not available. Our approach includes several elements, noting that these address your question about quality and outcomes:

- The activity must address a significant problem or need and help the funding agency carry out its mission.
- UNH researchers submit competitive-quality proposals that are subject to serious review by funding agency staff, and often by external reviewers in the academic community.
- Funded projects frequently have boards of advisors or scientific advisory/review panels that provide feedback to the project from the perspective of the end user or scientific community.
- In some cases, the funding agency provides a project or center co-director, or staff who are detailed to the University to work with the UNH project directors.
- Information about each project is publicly available.
- Performance is measured by whether the targeted need or problem is being successfully met or solved. This does usually result in peer-reviewed papers being published, but that alone is not considered sufficient progress to merit ongoing support.
- The Vice President for Research continuously monitors all activities using earmarked funds to ensure that they are performing well. This includes contact with the funding agency to evaluate the extent to which the activity is respected and welcomed by that agency.
- Researchers are encouraged to include students (both undergraduate and graduate) and junior faculty, practitioners, and agency personnel to the maximum extent possible.
- Researchers receiving earmarked funds are expected to continue seeking funds from a variety of other competitive sources.

The University of New Hampshire does not employ lobbyists. Rather, all requests are coordinated by University employees in our Office of Strategic Initiatives. Earmarked funds (like targeted funds obtained by requests to foundations and others) are seen in terms of their strategic development potential. Thus, any program or project funded through an earmark must meet a national need, but it also must build on or establish a strategically important research area at the University. Typically, these are interdisciplinary efforts that bring expertise together to address a specific problem, rather than extra funding for a preexisting effort.

Peer-reviewed competitive selection is properly seen as the cornerstone of sound research. As such, the University strongly supports the independence from political processes for the National Science Foundation and the National Institutes of Health. Our researchers apply to and are funded by both, and we are actively engaged in stimulating increased efforts with both by our faculty.

Let me use a specific example to illustrate some important distinctions. The Targeted Wind Sensing project funded by NOAA was developed to address a serious, long-term problem. Very little research is actually done in the atmosphere above our heads. NASA and NOAA satellites have done a wonderful job of studying the atmosphere as a whole – and our University has long been deeply involved in this effort through strictly competitive processes – but they are limited to what can be done from high altitude platforms. NASA and NOAA conduct periodic airplane-based campaigns, but their cost severely limits their frequency and duration. Our researchers participate in airplane missions, too, on a purely competitive basis.

Large-scale phenomena are important, but only part of the story. The atmosphere is heterogeneous and highly complex. Understanding these phenomena is essential to progress in understanding how and why air pollution evolves as it does, for example. However, the entire field of atmospheric chemistry has been seriously hampered by the unavailability of low cost platforms and low cost instruments. They simply do not exist, and we know of no funding that has been competitively available to develop them. Yet without platforms and instruments, researchers are unable to seek NSF or other funds. Our project has:

- Developed a unique research grade ozone sensor weighing 8 ounces and costing less than two thousand dollars.
- Five additional light weight and low cost sensors are in process of development to measure other important trace gases (e.g., carbon dioxide and carbon monoxide) and particulates.
- Supported two researchers at the University of Hawaii to accelerate development of a "smart balloon" capable of extended flight (weeks) at a fixed altitude.
- Supported a researcher at Smith College to develop an alternative small balloon technology with other desirable flight characteristics.
- Involved numerous undergraduate and graduate students at each institution as integral members of scientific teams.
- Published peer-reviewed papers in high-impact journals[1,2].

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[1] Mao, H., R. Talbot, D. Troop, R. Johnson, S. Businger, and A. M. Thompson (2006), Smart balloon observations over the North Atlantic: O_3 data analysis and modeling, *J. Geophys. Res.*, 111, D23S56, doi:10.1029/2005JD006507.

[2] Businger, S., R. Johnson, and R. Talbot, Applications for smart balloons in atmospheric research, *Bull. of the Amer. Meteorol. Soc.*, in press, 2006.

To illustrate the impact this already is having, last year a Smart Balloon carrying a UNH ozone sensor flew from Long Island across the Atlantic, skirting two hurricanes, and transmitting data every ten seconds for twelve days (via satellite telephone) before contact was lost when it crossed over Morocco. Nothing like this had ever been done before. Within the past month, as part of a NOAA atmospheric study in the Houston area, a balloon carrying the UNH ozone sensor was launched over Houston, went out over the Gulf, and traveled three days to Florida before coming down in a thunderstorm, again sending back data every ten seconds. In both cases, these instruments determined the precise movement of air pollution from one source to a distant destination, flowing with natural air currents.

Indeed, the Targeted Wind Sensing project is focusing primarily on sensor development specifically because a ranking NOAA official, after attending a lengthy review of the project, urged that course of action because, "it is very important and nobody else is doing it."

A second example may be helpful. The Coastal Response Resource Center was created through an earmark to meet an urgent need for better ways to deal with oil and other spills into our coastal environment. The total amount of funds from all sources in the United States for research projects in this area other than this Center was less than ten million dollars last year. NOAA responded to this funding by working with the University to develop a Cooperative Institute based at UNH, with NOAA and UNH Co-Directors. It has a broad based advisory board, with participation from several Federal agencies, States, and industry. A majority of its funds are awarded competitively nationwide to researchers from academic institutions, industry, and government through an NSF-like process. Currently, it is focusing special attention on the use of dispersants in managing spills, responding to a National Research Council concern that important issues had not been addressed. The conclusion to date from NOAA, as well as an annual review conducted by a panel of distinguished scientists representing a cross-section of the oil spill community, is that the Center's rigorous peer review of proposals has resulted in projects that are positively impacting spill response, recovery, and restoration. In addition, unlike NSF, the Center's Co-Directors and a scientist/practitioner from NOAA are actively involved in oversight of each of the projects so that the results can be translated as seamlessly and rapidly as possible into practice. The fact that the Center is a non-governmental entity, and based in a region devoid of oil production, also has been important in ensuring that the findings are credible.

It is important to stress that this activity could not have been undertaken through any known competitive process. This is not bypassing peer review, but doing something that needs to be done while adhering to the tenets of good science that translates into practice.

The Center is only one of a number of our programs resulting from earmarks that make funds available to outside researchers through competitive processes. This is about solving problems by engaging and involving talented researchers at our nation's best institutions.

In response to your other questions, I have attached a set of one-page summaries for virtually all of the projects and programs at UNH that have received earmarked funds during the time period you cite. You

will find information on project objectives and accomplishments in these one pagers. Additional information is available at the websites referenced on the summaries. These clearly show that the University of New Hampshire uses them to address serious problems in a serious way, with sustained attention on producing results. We do not have a standard policy regarding earmarks, other than adhering to the "high bar" principles discussed here.

Also enclosed is a document discussing the University's relationship with NOAA, the agency that has funded the vast majority of our earmarks. This, like the one-page summaries and referenced websites, illustrate the openness with which this University approaches these activities, and speaks to the use of these types of funds as strategic investments – of obvious value to us as New Hampshire's public university with our role in educating our future science and engineering workforce and supporting economic development in our state. You might be interested to know that in January 2006, a survey of these projects showed that 163 students are participating in the research, including 78 undergraduates. Most of these are in the science, technology, engineering and math (STEM) disciplines.

Finally, a note about our involvement with our Congressional delegation: New Hampshire is a small state, and its elected officials are accessible. So the University does not employ any lobbyists, but is apt to get calls from staffers asking about progress in a specific project. Our delegation, at least, is very insistent that we forward only high quality proposals addressing real problems, and that we deliver on our promises. It is up to the Senator or Representative to decide whether a proposal has merit. Our experience is that our delegation takes that responsibility very seriously.

Sincerely,

John D. Aber
Vice President for Research

Enclosures:
One-page summaries
"Managing Innovative Atmospheric, Coastal, Oceanic, and Climate Research at the University of New Hampshire," November 17, 2005.